# CHEMISTRY 1114 LECTURE SYLLABUS SPRING 2018

**Professor:** Dr Jerry Fong (587-3692, Physical & Health Sciences Bldg 305 ) e-mail: FONGJD@alfredstate.edu

**Office Hours:**  Mon 10, Tue, 1, Wed 10 Fri 11 or any time you find me in my office

**Required Text:** **Chemistry ( 10th ed.**  S. S. Zumdahl and S.A. Zumdahl, Brooks-Cole 2017) ISBN9781305957404 (an e-book equivalent is also available. If you get that, purchase just the PDF text w/o OWL software.)

**Syllabus:** Chapters 1-5; 7-10; 13-14 of text (see also: *Course Outline*, back page)

**Course Website:**  <http://web.alfredstate.edu/faculty/fongjd/GenChem1.htm>

**Grading: Item pts each total pts % of total**

Daily homework (website) 5-20 ~300 30

Exams (3) 100 300 30

Lab1 250 25

Comprehensive Final 150 150 15

100

**1Flunk Lab=Flunk Course !!!**

Course Letter grades will be assigned so: **A: 90-100% B: 80-89% C: 70-79% D:60-69% F: <60%**

**Course Mechanics:**

Short, daily homework assignments covering material covered in the previous lecture are due by the next lecture. Exams will be based on homework, and the many in-class written and Powerpoint exercises done during the class. A course website listed above serves as the repository for answers to the homework, exams and in-class Powerpoint exercises, All Powerpoint lectures and other course documents are likewise accessible at the course website. The website is homegrown and not part of Blackboard.

**Attendance and Student Conduct:**

Attendance is up to you. You’re paying for this so you can waste your money or see the show. FYI, I put on a pretty good show with lots of cats, so missing it is your loss. Also, if you chose to absent yourself the homework due that day is forfeit. If you simply cannot attend for some reason I will need a legitimate reason > 8 hours ***in advance*** of the class unless you have a verifiable medical excuse/personal emergency, Just an e-mail saying you’re `sick’ (e.g. hung over) or that your hamster died 10 minutes before class is not sufficient. If you do claim sickness, I’ll need definitive proof, not just your word.

You will be ejected from class permanently with an Instructor Initiated Drop and an F if you act with chronic and blatant disregard with the Alfred State code of behavior. This policy will be in particular force if you are caught cheating or acting unethically in any way**. I detest** cheaters.

All cell and smart phones are to be stowed, turned off or drop-kicked during class (unless you actually use the phone to take notes –which to me seems crazy). I’m old school and deplore all that distracting junk. I contend it has made folks worse at communicating, not better. For each 50 minute lecture you’re mine. You’ll be asked to leave the lecture room for that day if you fail to abide by this rule. Laptops and smart tablets, however, are quite okay-as long as you aren’t e-mailing porn to each other.

Also, keep your cake holes shut while I’m talking. I can’t be clearer about this. If a few thoughtless, bad-mannered and self-centered students yack while I lecture, those around them can’t hear the lecture. In the last few years, this has become a huge problem and it annoys the living shit out of me. The behavior reflects an absence of respect for both fellow students and the enterprise of learning that has become epidemic in the last years. Don’t bring that attitude here or it will be an ugly semester for both you and I.

That said, I strongly encourage direct contact. Raise your hands. Ask questions. Feel free to talk to me without fear of reprisal concerning any and all problems in the class. I am almost always skulking about either in lab or in my office and practice an open door policy. If you have question or problem on what we’re doing in chemistry-see me about it; it’s what I live for. I am **always** willing to drop whatever I’m doing to help a student.

**Student Learning Outcomes (SLOs).** At the end of the course students will be able to:

1) convert between pertinent unit systems : Metric-metric, metric-English.

2) provide a basic description of atomic and electronic structures of atoms .

3) rationalize and manipulate electronic models for stable cases of molecules and atoms.

4) predict and name common inorganic compounds using Lewis rules and naming protocols.

5) perform basic chemical calculations connected to mole-weight conversions; reaction stoichiometry and limiting yields.

6) write, balance, identify and name pertinent reaction classes and components (metatheses, acid-base, redox).

7) demonstrate competence in basic laboratory skills, notably gravimetric and volumetric methods, distillation, filtration , melting point determination and chemical synthesis.

**Some Comments:**

Most of you are being ***forced*** to take Chemistry. I wish it were otherwise but if we gave students a choice between taking Chemistry and a full colon enema, many would pick the latter; the pain is shorter-lived. So why are you being made to take this apparently gut-wrenching subject? Bill Gates of Microsoft fame dropped out of Harvard, never took Chemistry but now has more money than Finland. Taking chemistry is simply not critical to success in life in most cases. Yet, it is undeniable that as a species we live only by the spidery grace of chlorophyll, breathe only on the sticky strength of iron hemes, sleep only by order of melatonin, see only by permission of 11-cis/trans retinal. Our human essence is written in the dense A-T, G-C music of DNA. Even Mr. Gate’s software operates at the sufferance of phosphorus and boron-doped silicon. Chemistry ***rules***. You can ignore it, but it is central to ***everything.***

Now consider that all the above are molecules, the main focus of Chemistry. Yet molecules are too small to glimpse even with the most expensive and extreme of instruments. They are also 99.99% empty space, yet the massless electronic forces in that space defines `solid’ for everything including the chair you are sitting on. Molecular behavior is fundamentally unpredictable, yet given time, opportunity and communication they can aggregate and transform into things as disparate and improbable as elephants and viruses, Twinkies and microchips.

Chemistry is where you get a handle on all of this. It is an intricate and sinuous tale about how our flawed, yet diversely talented species attempts to see and manipulate the un-seeable entirely by indirect means-like figuring out what that elephant looks like by sniffing its musk, or making it dance by changing the lighting. The style of thinking that lets you do this-and get it right- is what I refer to as `**TLC**’ =**T**hinking **L**ike a **C**hemist. **TLC** is what I’m going to try to teach you.

We’ll do it by getting into the heads of people like Dalton, Lavoisier, Mendeleev, Arrhenius, Lewis, and Pauling. Each of these legendary chemists are `masters’ of a particular flavor of **TLC** unique and distinct to their time, culture and personality. My idea is that by having you relive their thought processes, you’ll gain a piece of their habits and disciplines of mind.

To do this we need to have real dialogue with a focus on getting at whatever’s hanging you up. Raise your stinking hands if you have question fer criss sake. There is no such thing as a dumb question in my classroom. We need to honestly converse and you need to lose the idea of me as a live U-tube segment. Dialogue and open struggle leads to knowing things deep in your bones, a knowing that is almost cellular and instinctual. If you get there– no matter what the subject- you’ve really learned something. It also takes consistent, daily and focused effort, kids. There is no such thing as a born chemist. You ‘get’ chemistry by sheer effort and by not being afraid to ask questions.

Finally, I encourage you all to study chemistry as a human. Study in small groups and teams. **Talk** to each other. Argue, sweat and squabble over Chemistry. We are a social species. We learn best when there’s someone else to talk and commiserate with. Now get ready to get off your rear ends and go to work.

Doc Fong 11 Jan 2018

## COURSE OUTLINE

**Week(s) dates lecture topics text reading**

**1 1/22-1/26 Units, Prefixes, Sig Figs and Measurement Concepts: the ground floor pp. 8-22**

**2 1/29-2/2 Atoms, Elements, Compounds and Periodicity: the Big Picture pp. 35-64**

**3 2/5-2/9 Basic Mole Calculations: counting by weighing pp. 68-90**

**4 2/12-2/16 Stoichiometry: how much meth can we make ? pp. 90-111**

**5 2/19-2/23 Solutions, Solution Calculations and C1V1=C2V2: pp. 116-130**

**getting our chemical feet wet**

**5 2/21 Wednesday 21 February Exam I: Material from Weeks 1-4**

**6 2/26-3/2 Metatheses (Precipitation) and Acid/Base Reactions: pp. 130-143**

**chemistry we can see**

**7 3/5-3/9 Acid/Base Reactions (continued): titrations-chemistry we can measure**

**Redox Reactions: light, heat and explosions R’ us pp. 143-158**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**8 3/10-3/18 Spring Break: Saturday March 10- Sunday March 18**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**9 3/19-3/23 Redox Reactions (continued): balancing, batteries and electric cars;**

**Introduction to Gas Laws-how we finally figure out that water is H2O; pp. 164-189**

**10 3/26-3/30 Gas Laws (continued): calculating till we pass gas**

**11 4/2-4/6 More Calculations and the Kinetic Model of Gases: when wackos are right pp. 189-192; 219-222**

**11 4/4 Wednesday 6 April Exam II: Material from Weeks 6-10**

**12 4/9/1-4/13 Atomic Structure; the trials and tribulations of trying to see pp. 251-275; 278-284**

**where electrons live in an atom**

**13 4/16-4/20 Lewis’s Bonding Model: how America got its chemical groove on pp. 311-312;325-329**

**14 4/23-4/27 Lewis’s Bonding Model (continued)**

**15 4/30-5/4 Beyond the Octet Rule: resonance, formal charge and other ugly facts pp. 329-350**

**15 5/2 Wednesday 2 May Exam III: Material from Weeks 11-15**

**16 5/7-5/11 FINAL EXAMS**